

```

1 FINDPATTERNS ON PIR: * allowing 0 mismatches
1 1ST(G,F,K,Y,R,W)SLSLDIAL(G,F,K,Y,R,W)(A,F,K,Y,R,W)(G,F,K,Y,R,W)(G,F,K,Y,R,W)
1 ROECA CK: 9068 Len: 353 1 recombination protein recA - Escherichia coli
1 1ST(G,F,K,Y,R,W)SLSLDIAL(G,F,K,Y,R,W)(A,F,K,Y,R,W)(G,F,K,Y,R,W)(G,F,K,Y,R,W)
41: MDVERT ISTGSLSLDIALGAGGLPMGRIVEIY GPESS
S37586 CK: 8556 Len: 356 1 recombination protein recA - Yersinia pestis
1 1ST(G,F,K,Y,R,W)SLSLDIAL(G,F,K,Y,R,W)(A,F,K,Y,R,W)(G,F,K,Y,R,W)(G,F,K,Y,R,W)
41: MDVERT ISTGSLSLDIALGAGGLPMGRIVEIY GPESS
S31481 CK: 7629 Len: 354 1 recombination protein recA - Enterobacter
1 1ST(G,F,K,Y,R,W)SLSLDIAL(G,F,K,Y,R,W)(A,F,K,Y,R,W)(G,F,K,Y,R,W)(G,F,K,Y,R,W)
41: MDVERT ISTGSLSLDIALGAGGLPMGRIVEIY GPESS
Databases searched:
NBRF, Release 62.0, Released on 30Sep1999, Formatted on 26Oct1999
Total finds: 3
Total length: 47,169,319
Total sequences: 142,080
CPU time: 03:22.76
1 1AA_SEQUENCE 1.0
1: ROECA - recombination protein recA - Escherichia coli
N: Alternate names: recombinase A
C: Species: Escherichia coli
C: Date: 31-Jul-1980 #sequence_revision 14-Nov-1997 #text_change 16-Jul-1998
C: Accession: G65049; A93847; A93846; S11931; S63525; S69129; S63979; A03548
R: Blatner, F.R.; Plunkett III, G.; Bloch, C.A.; Perna, N.T.; Burland, V.;
Riley, M.; Collado-Vides, J.; Glasner, J.D.; Rode, C.K.; Mayhew, G.F.; Gregor,
J.; Davis, N.W.; Kirkpatrick, H.A.; Goeden, M.A.; Rose, D.D.; Mau, B.; Shao, Y.
Title: The complete genome sequence of Escherichia coli K-12.
A: Reference number: A64720; MUID: 97426617
A: Accession: G65049
A: Status: nucleic acid sequence not shown; translation not shown
A: Molecule type: DNA
A: Residues: 1-353 <BLAT>
A: Cross-references: GB:AE000354; GB:U00096; NID:q2367149; PIDN:AACT5741.1;
PID:q1789051; UNKPD:2699
A: Experimental source: strain K-12, substrain MG1655
R: Horii, T.; Ogawa, T.; Ogawa, H.
Proc. Natl. Acad. Sci. U.S.A. 77, 313-317, 1980
A: Title: Organization of the recA gene of Escherichia coli.
A: Reference number: A93847; MUID: 80145618
A: Accession: A93847
A: Molecule type: DNA
A: Residues: 2-353 <HOR>
A: Cross-references: GB:V00328; NID:q42672; PIDN:CAA23618.1; PID:q42673
R: Sanck, A.; Stachel, C.; Konigsberg, W.; Rupp, W.D.
Proc. Natl. Acad. Sci. U.S.A. 77, 2611-2615, 1980
A: Title: Sequences of the recA gene and protein.
A: Reference number: A93846; MUID: 80234673
A: Accession: A93846
A: Molecule type: DNA
A: Residues: 2-353 <SAN>
A: Cross-references: GB:V00328; GB:J01672; NID:q42672; PIDN:CAA23618.1;
PID:q42673
R: Zhao, X.J.; McEntee, K.
Mol. Gen. Genet. 222, 369-376, 1990
A: Title: DNA sequence analysis of the recA genes from Proteus vulgaris, Erwinia
carotovora, Shigella flexneri and Escherichia coli B/r.
A: Reference number: S11931; MUID: 91109725
A: Accession: S11931
A: Molecule type: DNA
A: Residues: 2-353 <ZHA>
A: Cross-references: GB:X5552; NID:q42678
A: Note: this ORF is not annotated in GenBank entry ECRACAGW, release 109.0
R: Morimatsu, K.; Horii, T.
Eur. J. Biochem. 234, 695-705, 1995
A: Title: DNA-binding surface of RecA protein. Photochemical cross-linking of
the first DNA binding site on RecA filament.
A: Reference number: S63525; MUID: 96096752
A: Accession: S63525
A: Status: preliminary
A: Molecule type: protein
A: Residues: 65-69; 90-97; 119-184; 200-207; 258-265; 304-311; 323-331 <MOR>
R: Morimatsu, K.; Horii, T.
Eur. J. Biochem. 228, 772-778, 1995
A: Title: The DNA-binding site of the RecA protein. Photochemical cross-linking
of Tyr103 to single-stranded DNA.
A: Reference number: S69129; MUID: 95255284
A: Accession: S69129
A: Status: preliminary
A: Molecule type: protein
A: Residues: 90-108; 180-184 <MOR2>
R: Gardner, R.V.; Voloshin, O.N.; Camerini-Otero, R.D.
Eur. J. Biochem. 233, 419-425, 1995
A: Title: The identification of the single-stranded DNA-binding domain of the
Escherichia coli RecA protein.
A: Reference number: S63979; MUID: 96067680
A: Accession: S63979
A: Molecule type: protein
A: Residues: 187-190, 192-194 <GAR>
R: Xu, X.; Egelman, E.H.
Submitted to the Brookhaven Protein Data Bank, December 1996
A: Reference number: A67271; PDB: 2REC
A: Contents: annotation; X-ray crystallography, 2.3 angstroms, residues
4-157; 166-195; 211-329
R: Ahnata, H.; Ito, Y.; Kurumizaka, H.; Terada, T.; Yokoyama, S.; Shibata, T.
Submitted to the Brookhaven Protein Data Bank, January 1997
A: Reference number: A67455; PDB: 1A43
A: Contents: annotation; conformation by (1)H- and (15)N-NMR, residues 269-331
C: Genes: recA
A: Gene: recA
A: Map position: 58 min
C: Function:
A: Description: plays an essential role in homologous recombination, in
induction of the SOS response, and in initiation of stable DNA replication
C: Superfamily: recombination protein recA
C: Keywords: ATP; DNA binding; DNA recombination; DNA repair; P-loop; SOS
response
F: 67-74/Region: nucleotide-binding motif A (P-loop)
F: 141-146/Region: nucleotide-binding motif B
F: 73/Binding site: ATP (Lys) #status predicted
ROECA Length: 353 April 26, 2000 08:17 Type: P Check: 9068
1 MAIDENKOKA LAAALGQIEK QFGKSTIMRL GEDBSMDVET ISTGSLSLDI
51 ALGAGGLPMG RIVEIYGPES SGTITLTVQ IMAAQREGKT CAPIDAEHAL
101 DPYARKLVG DIDNLCSP DTGEALFIC DALARSAVD VIYVDSVAL
151 TPRAEIGET GDSHGLAR MMSQMRKLA GNLKQSTTL IFNQRMKI
201 GVMFNDPPT TGGNALKFYA SVREDIRRG AVKGENVWG SETRVKVN
251 KNAFROAE FOLLYEGIN FYGELVDGV KEKLEKAGA WYSYKGEKIG
301 QGRNATAML KNPETAKET EKKVRELLS NPNSPTDFSV DSEGVAEIN
351 EDF

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!!AA_SEQUENCE 1.0
P1:S37586 - recombinaton protein reca - Yersinia pestis
N:Alternate names: recombinase A
C:Species: Yersinia pestis
C>Date: 06-Jan-1995 #sequence_revision 06-Jan-1995 #text_change 26-Aug-1999
C:Accession: S37586
R:Kryukov, V.M.; Suchkov, I.Y.; Sazykin, I.S.; Mishankin, B.N.
submitted to the EMBL Data Library, October 1993
A:Description: Complete nucleotide sequence of Yersinia pestis reca gene.
A:Reference number: S37586
A:Accession: S37586
A>Status: preliminary
A:Molecule type: DNA
A:Residues: 1-356 <KRY>
A:Cross-References: EMBL:X75336; NID:g406793; PIDN:CAAS3084.1; PID:g406794
C:Genetics:
A:Gene: reca
C:Superfamily: recombinaton protein reca
C:Keywords: ATP; DNA binding; DNA recombination; DNA repair; P-loop; SOS
response
E:67-74/Region: nucleotide-binding motif A (P-loop)
E:141-146/Region: nucleotide-binding motif B
E:73/Binding site: ATP (Lys) #status predicted

S37586 Length: 356 Apr11 26, 2000 08:17 Type: P Check: 8556 ..

1 MAIDENKOKA LAAALGQIEK QFGKGSIMRL GEDRSMDET ISTGSLSDI
51 ALGAGGLPMG RIVEIYGPES SGTITLTLOY IAAOREGKT CAFIDAEHAL
101 DPIYAKRLGV DIDNLCSP DTGEQALEIC DALTRSGAVD VTIYDSVAL
151 TPKEIEGEI GDSHMGLAAR MMSQAMRKA GNKNANTLL IFINOIRMKI
201 GVMFGNPETT TGNALKEFYA SVRLDIRRIG AVKGDVVG SETRVKVKYN
251 KIAAPFKQAE FOILYEGIN INGELVDLGV KKLIEKAGA WSYNGEKIG
301 QGKANSNTL KENPANAEL DKRIEMLLN GNGEQPVAA ATAEPADGAD
351 ETNEEF

!!AA_SEQUENCE 1.0
P1:S31481 - recombinaton protein reca - Enterobacter agglomerans
N:Alternate names: recombinase A
C:Species: Enterobacter agglomerans
C>Date: 13-Jan-1995 #sequence_revision 13-Jan-1995 #text_change 26-Aug-1999
C:Accession: S31481
R:Rappold, C.S.J.; Klingmüller, W.
submitted to the EMBL Data Library, January 1993
A:Description: Cloning and sequencing of the reca gene from Enterobacter
agglomerans 339.
A:Reference number: S31480
A:Accession: S31481
A>Status: preliminary
A:Molecule type: DNA
A:Residues: 1-354 <RAP>
A:Cross-References: GB:I03291; EMBL:Z19517; NID:g1209306; PIDN:AAA91766.1;
PID:g1209308
C:Genetics:
A:Gene: reca
C:Superfamily: recombinaton protein reca
C:Keywords: ATP; DNA binding; DNA recombination; DNA repair; P-loop; SOS
response
E:67-74/Region: nucleotide-binding motif A (P-loop)
E:141-146/Region: nucleotide-binding motif B
E:73/Binding site: ATP (Lys) #status predicted

S31481 Length: 354 Apr11 26, 2000 08:17 Type: P Check: 7629 ..

1 MAIDENKOKA LAAALGQIEK QFGKGSIMRL GEDRSMDET ISTGSLSDI
51 ALGAGGLPMG RIVEIYGPES SGTITLTLOY IAAOREGKT CAFIDAEHAL

```

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101 DPIYAKRLGV DIDNLCSP DTGEQALEIC DALTRSGAVD VTIYDSVAL
151 TPKEIEGEI GDSHMGLAAR MMSQAMRKA GNKNANTLL IFINOIRMKI
201 GVMFGNPETT TGNALKEFYA SVRLDIRRIG AVKGDVVG SETRVKVKYN
251 KIAAPFKQAE FOILYEGIN INGELVDLGV KKLIEKAGA WSYNGEKIG
301 QGKANSNTL KENPANAEL DKRIEMLLN GNGEQPVAA ATAEPADGAD
351 SEEF

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! FINDPATTERNS on FIR: \* allowing 0 mismatches

1 (I,W,Y,F,H,S(T,W,Y,F,H)G(S,W,Y,F,H)LSLID(A,W,Y,F,H)LGAGG(L,W,Y,F,H)PMGRIVEIT

ROECA ck: 9068 len: 353 ! recombination protein reca - Escherichia coli

1 (I,W,Y,F,H,S(T,W,Y,F,H)G(S,W,Y,F,H)LSLID(A,W,Y,F,H)LGAGG(L,W,Y,F,H)PMGRIVEIT  
41: MDVET (I)S(TTG(S)LSLID(A)LGAGG(L)PMGRIVEIT  
ISTGSLSLIDIALGAGGLPMGRIVEIT

S37586 ck: 8556 len: 356 ! recombination protein reca - Yersinia pestis

41: MDVET (I,W,Y,F,H,S(T,W,Y,F,H)G(S,W,Y,F,H)LSLID(A,W,Y,F,H)LGAGG(L,W,Y,F,H)PMGRIVEIT  
(I)S(TTG(S)LSLID(A)LGAGG(L)PMGRIVEIT  
ISTGSLSLIDIALGAGGLPMGRIVEIT

S31481 ck: 7629 len: 354 ! recombination protein reca - Enterobacter

1 (I,W,Y,F,H,S(T,W,Y,F,H)G(S,W,Y,F,H)LSLID(A,W,Y,F,H)LGAGG(L,W,Y,F,H)PMGRIVEIT  
41: MDVET (I)S(TTG(S)LSLID(A)LGAGG(L)PMGRIVEIT  
ISTGSLSLIDIALGAGGLPMGRIVEIT

Databases searched:

NBRF, Release 62.0, Released on 30sep1999, Formatted on 26oct1999

Total finds: 3

Total length: 47,169,319

Total sequences: 142,080

CPU time: 06:57.36

!!AA\_SEQUENCE 1.0

PI:ROECA - recombination protein reca - Escherichia coli

N:Alternate names: recombinase A

C:Species: Escherichia coli

C:Date: 31-Jul-1980 #sequence: revision 14-Nov-1997 #text: change 16-Jul-1999

C:Accession: G65049: A93847, A93846, S11931, S63525, S63129, S63979, A03548

R:Blattner, F.R.; Plunkett III, G.; Bloch, C.A.; Perna, N.T.; Burland, V.;

Riley, M.; Collado-Vides, J.; Glasner, J.D.; Rode, C.K.; Mayhew, G.F.; Gregor,

J.; Davis, N.W.; Kirkpatrick, H.A.; Goeden, M.A.; Rose, D.J.; Mau, B.; Shao, Y.

Science 277, 1453-1462, 1997

A:Title: The complete genome sequence of Escherichia coli K-12.

A:Reference number: A6720; MUID:97426617

A:Accession: G65049

A:Status: nucleic acid sequence not shown; translation not shown

A:Molecule type: DNA

A:Residues: 1-353 <BLAT>

A:Cross-references: GB:AE000354; GB:U00096; NID:92367149; PIDN:AACT5741.1;

PID:91799051; UMG:db2699

A:Experimental source: strain K-12, substrain MG1655

R:Horii, T.; Ogawa, T.; Ogawa, H.

Proc. Natl. Acad. Sci. U.S.A. 77, 313-317, 1980

A:Title: Organization of the reca gene of Escherichia coli.

A:Reference number: A93847; MUID:80145618

A:Accession: A93847

A:Molecule type: DNA

A:Residues: 2-353 <HOR>

A:Cross-references: GB:V00328; NID:942672; PIDN:CAA23618.1; PID:942673

R:Sanjar, A.; Stacheler, C.; Konigsberg, W.; Rupp, W.D.

Proc. Natl. Acad. Sci. U.S.A. 77, 2611-2615, 1980

A:Title: Sequences of the reca gene and protein.

A:Reference number: A93846; MUID:80234673

A:Accession: A93846

A:Molecule type: DNA

A:Residues: 2-353 <SAN>

A:Cross-references: GB:V00328; GB:J01672; NID:942672; PIDN:CAA23618.1;

PID:942673

R:Zhao, X.J.; McEntee, K.

Mol. Gen. Genet. 222, 369-376, 1990

A:Title: DNA sequence analysis of the reca genes from Proteus vulgaris, Erwinia

carotovora, Shigella flexneri and Escherichia coli B/r.

A:Reference number: S11931; MUID:91109725

A:Accession: S11931

A:Molecule type: DNA

A:Residues: 2-353 <ZHA>

A:Cross-references: GB:X5552; NID:942678

A:Note: this ORF is not annotated in Genbank entry ECRCA2GEN, release 109.0

R:Moriwatsu, K.; Horii, T.

Eur. J. Biochem. 234, 695-705, 1995

A:Title: DNA-binding surface of RecA protein. Photochemical cross-linking of

the first DNA binding site on RecA filament.

A:Reference number: S63525; MUID:96096752

A:Accession: S63525

A:Status: preliminary

A:Molecule type: protein

A:Residues: 65-69;90-97;179-184;200-207;258-265;304-311;323-331 <MOR1>

R:Moriwatsu, K.; Horii, T.

Eur. J. Biochem. 228, 772-778, 1995

A:Title: The DNA-binding site of the RecA protein. Photochemical cross-linking

of Tyr103 to single-stranded DNA.

A:Reference number: S69129; MUID:95355284

A:Accession: S69129

A:Status: preliminary

A:Molecule type: protein

A:Residues: 90-108;180-184 <MOR2>

R:Gardner, R.V.; Voloshin, O.N.; Cammerint-Otero, R.D.

Eur. J. Biochem. 233, 419-425, 1995

A:Title: The identification of the single-stranded DNA-binding domain of the

Escherichia coli RecA protein.

A:Reference number: S63979; MUID:96067680

A:Accession: S63979

A:Molecule type: protein

A:Residues: 187-190,192-194 <GAR>

R:Yu, X.; Egelman, E.H.

Submitted to the Brookhaven Protein Data Bank, December 1996

A:Reference number: A67277; PDB:2REC

A:Contents: annotation; X-ray crystallography, 2.3 angstroms, residues

4-157;166-195;211-329

R:Albarr, H.; Ito, Y.; Kurumizaka, H.; Terada, T.; Yokoyama, S.; Shibata, T.

Submitted to the Brookhaven Protein Data Bank, January 1997

A:Reference number: A67455; PDB:1AA3

A:Contents: annotation; conformation by (1)H- and (15)N-NMR, residues 269-331

C:Genetics:

A:Gene: reca

A:Map position: 58 min

C:Function:

A:Description: plays an essential role in homologous recombination, in

induction of the SOS response, and in initiation of stable DNA replication

C:Superfamily: recombination protein reca

C:Keywords: ATP; DNA binding; DNA recombination; DNA repair; P-loop; SOS

response

E:67-74/Region: nucleotide-binding motif A (P-loop)

E:141-146/Region: nucleotide-binding motif B

F:73/Binding site: ATP (lys) #status predicted

ROECA Length: 353 April 26, 2000 08:18 Type: P Check: 9068

1 MAIDENKOKA LAAALGQIEK QFGKSTIMRL GEDRSDVET ISTGSLSDI

51 ALGAGGLPMG RIVEIYGPES SGTTLTLQV IAAAGREGT CAFIDAEHAL

101 DTYARKLV DIDNLGQSP DTGQALGIC DALARGAND VIYDVSAAL

151 TRAEIEGTI GDSHGLAAR MMSQAMKLA GNLKOSNTLL IFINOIRKTI

201 GWMFNPEET TGNALKEYA SVRLDIRIG AVKEGENVVG SETRYKVVKN

251 KIAAPFKQAE FOILYSEGIN FYGELVDLVG KEKLEKAGA WYSYGEKIG

301 OGKANTAML KDNPEATAEI EKKYRELLLS NNSITPDSV DDEGVAETN

351 EDF

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11AA_SEQUENCE 1.0
PI:537586 - recombination protein reca - Yersinia pestis
N:Alternate names: recombinase A
C:Species: Yersinia pestis
C:Date: 06-Jan-1995 #sequence_revision 06-Jan-1995 #text_change 26-Aug-1999
C:Accession: S37586
R:Kyukov, V.N.; Suchkov, I.Y.; Sazykin, I.S.; Mishankin, B.N.
submitted to the EMBL Data Library, October 1993
A:Description: Complete nucleotide sequence of Yersinia pestis reca gene.
A:Reference number: S37586
A:Accession: S37586
A:Status: preliminary
A:Molecule type: DNA
A:Residues: 1-356 <KRY>
A:Cross-references: EMBL:X75336; NID:g406793; PIDN:CAAS3084.1; PID:g406794
C:Genetics:
A:Gene: reca
C:Superfamily: recombination protein reca
C:Keywords: ATP; DNA binding; DNA recombination; DNA repair; P-loop; SOS
response
F:67-74/Region: nucleotide-binding motif A (P-loop)
F:141-146/Region: nucleotide-binding motif B
F:73/Binding site: ATP (Lys) #status predicted

S37586 length: 356 April 26, 2000 08:18 Type: P Check: 8556 ..

1 MAIDENKOKA LAAALGOIEK QFGKGSIMRL GEDRSMDET ISTGSLSLDI
51 ALGAGGLPMG RIVEIYGPES SGTITLTLOV IAAAREGKT CAFIDAEHAL
101 DPIYAKKLV DIDNLLCSQP DTGEQALEIC DALTRSGAVD VIIVDSVAL
151 TPRAIEGEI GDShMGLAAR MMSQAMRKL GNLKNANTLL IFINQIRMKI
201 GVMGNPEPT TGNALKEFYA SVRLDIRRG AVKGDVYVG SETRVKRVKN
251 KIAAPFQAE FOILYEGIN INGELVDIGV KKLIEKAGA WSYSGDKIG
301 QGKANASNYL KENPANAEL DKLRMLIN GNGEOPVAA ATAFAADGAD
351 ETNEEF

11AA_SEQUENCE 1.0
PI:531481 - recombination protein reca - Enterobacter agglomerans
N:Alternate names: recombinase A
C:Species: Enterobacter agglomerans
C:Date: 13-Jan-1995 #sequence_revision 13-Jan-1995 #text_change 26-Aug-1999
C:Accession: S31481
R:Reppold, C.S.J.; Klingmüller, W.
submitted to the EMBL Data Library, January 1993
A:Description: Cloning and sequencing of the reca gene from Enterobacter
agglomerans 339.
A:Reference number: S31480
A:Accession: S31481
A:Status: preliminary
A:Molecule type: DNA
A:Residues: 1-354 <RAP>
A:Cross-references: GB:L03291; EMBL:Z19517; NID:g1209306; PIDN:AAA91766.1;
PID:g1209308
C:Genetics:
A:Gene: reca
C:Superfamily: recombination protein reca
C:Keywords: ATP; DNA binding; DNA recombination; DNA repair; P-loop; SOS
response
F:67-74/Region: nucleotide-binding motif A (P-loop)
F:141-146/Region: nucleotide-binding motif B
F:73/Binding site: ATP (Lys) #status predicted

S31481 length: 354 April 26, 2000 08:18 Type: P Check: 7629 ..

1 MAIDENKOKA LAAALGOIEK QFGKGSIMRL GEDRSMDET ISTGSLSLDI
51 ALGAGGLPMG RIVEIYGPES SGTITLTLOV IAAAREGKT CAFIDAEHAL

```

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101 DPIYAKKLV DIDNLLCSQP DTGEQALEIC DALTRSGAVD VIIVDSVAL
151 TPRAIEGEI GDShMGLAAR MMSQAMRKL GNLKNANTLL IFINQIRMKI
201 GVMGNPEPT TGNALKEFYA SVRLDIRRG AVKGDVYVG SETRVKRVKN
251 KIAAPFQAE FOILYEGIN INGELVDIGV KKLIEKAGA WSYSGEKIG
301 QGKANASNYL KENPANAEL DKLRMLIN GNGEOPVAA ATAFAADMET
351 SEEF

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